

*Severe Local Storage.—Continued.*

| Place.                                  | Date. | Time.      | Width of path (yards). | Loss of life. | Value of property destroyed. | Character of storm.         | Remarks.   | Authority.   |
|---|-------|------------|------------------------|---------------|------------------------------|-----------------------------|--|--|
| Flora, Ill.                             | 12    |            |                        |               | 2,400                        | Wind and hail               | Damage to silos, fences, etc.  | Official, U. S. Weather Bureau.  |
| Central Illinois                        | 13    | A. m.      |                        |               | 75,000                       | Electrical and wind.        | Property damage heavy. Electric light and power service crippled; trees uprooted, crops damaged, roads impassable. Mine wrecked, five persons injured. | Official, U. S. Weather Bureau; Illinois State Register (Springfield, Ill.). |
| South central Indiana                   | 13    |            |                        |               | 200,000                      | Wind                        | Many buildings destroyed and grain fields and orchards injured.  | Official, U. S. Weather Bureau.  |
| St. Paul, Minn.                         | 15    | P. m.      |                        |               |                              | Electrical and rain.        | Three persons injured. Tracks washed out and other minor damage.   | Dispatch (St. Paul, Minn.).  |
| Northwestern Wisconsin                  | 15-16 |            |                        | 8             | 500,000                      | Tornado and electrical.     | Houses and barns destroyed, live stock killed, crops injured, 100 persons injured.   | Official, U. S. Weather Bureau; Sentinel (Milwaukee, Wis.).                  |
| Antigo, Wis. (near)                     | 16    | 2:30 p. m. | 50 to 100              |               | 50,000                       | Tornado                     | Ten farm buildings destroyed, many trees damaged, live stock killed, and crop damage great.  | Official, U. S. Weather Bureau.  |
| Lansing, Mich. (near)                   | 16    | 9:30 p. m. | 70                     |               | 2,500                        | do.                         | Buildings damaged; trees broken off.   | Do.  |
| Scranton, Pa.                           | 17    |            |                        |               |                              | Rain                        | Heavy rains cause severe property damage, also the tie-up of railroads for several days.   | Do.  |
| Valley Station, Ky. (near)              | 17    |            |                        | 4             |                              | Electrical                  | Four men killed and five injured by lightning.   | Do.  |
| North and central New York              | 17    |            |                        | 2             | 2,000,000                    | Electrical and cloudbursts. | Scores of persons injured, and severe property damage by a series of electrical storms and floods.   | World (New York); Post-Standard (Syracuse, N. Y.).                           |
| Carbondale, Pa., and vicinity           | 17-18 |            |                        |               |                              | Thunderstorms               | Homes, business houses, and mines damaged by floods. Traffic stopped. Damage estimated at millions.  | Official, U. S. Weather Bureau; Philadelphia Record (Pa.).                   |
| Atlanta, Ga.                            | 18    |            |                        |               |                              | do.                         | Electric light, telephone and street car systems out of commission. Trees down, wires broken, basements flooded.                                       | Official, U. S. Weather Bureau.  |
| Memphis, Tenn., and vicinity            | 18    |            |                        |               |                              | Electrical, rain, and wind. | Damage to buildings, trees, etc. Traffic delayed by flood and debris. Estimated damage, thousands of dollars.  | Official, U. S. Weather Bureau; Commercial Appeal (Memphis, Tenn.).          |
| Brentwood, Fla.                         | 19    |            |                        |               | 3,000                        | Thunder and wind.           | Damage to fair grounds.  | Official, U. S. Weather Bureau.  |
| Springfield, Ky.                        | 19    |            |                        |               | 25,000                       | Rain                        | Considerable damage by washout.  | Do.  |
| Macon, Ga.                              | 20    |            |                        |               |                              | Electrical                  | Sewer-pipe works badly damaged.  | Do.  |
| Central New York                        | 21-22 |            |                        |               |                              | Rain                        | Heavy damage from floods.  | Press (Binghamton, N. Y.).   |
| Williston, N. Dak., and vicinity        | 22-23 |            |                        | 1             |                              | Rain and wind               | Damage to buildings, trees, etc., and by flooding. Several persons injured.  | Official, U. S. Weather Bureau; Williston Herald (N. Dak.).                  |
| Bottineau County, N. Dak.               | 23    |            |                        |               | 300,000                      | Tornado                     | About 50 barns, 30 dwellings, 100 outbuildings, and 50 windmills destroyed.  | Williams County Farmers Press (Williston, N. Dak.).                          |
| Wichita, Kans.                          | 24    | 7 p. m.    |                        |               |                              | Wind and rain               | Electric and street-car service interrupted, streets flooded, wheat crop damaged, and live stock killed.   | Wichita Eagle (Kans.).   |
| Marshall and Washington Counties, Kans. | 25    | P. m.      |                        |               |                              | Hail and rain               | Wheat and oat crops total loss.  | Official, U. S. Weather Bureau.  |
| Fort Oglethorpe, Ga.                    | 27    | 4 p. m.    |                        | 1             |                              | Wind                        | Walls blown down. Two injured.   | Star (Washington, D. C.).  |
| Hornell, N. Y., and vicinity            | 28-29 |            |                        |               |                              | Cloudbursts and electrical. | Heavy damage from flooding to tracks, highways, and crops. Barn burned.  | Star-Gazette (Elmira, N. Y.).  |
| Goddard, Kans.                          | 29    | P. m.      |                        |               |                              | Wind, rain, and hail.       | Wheat crop damaged. Telephone systems out of commission.   | Wichita Eagle (Kans.).   |
| Adair County, Ky.                       | 29    |            |                        |               |                              | Electrical and rain.        | Crops damaged and several head of cattle killed by lightning.  | Official, U. S. Weather Bureau.  |
| Normal, Ill.                            | 30    |            |                        |               |                              | Wind                        | Trees and wires blown down.  | Do.  |

## STORMS AND WEATHER WARNINGS.

By EDWARD H. BOWIE, Supervising Forecaster.

## TROPICAL STORM IN THE WEST GULF OF MEXICO.

The morning of the 15th meteorological observations by radio from vessels in the southwestern Gulf of Mexico disclosed the presence of a disturbance of moderate intensity central off the port of Tampico, Mexico. This disturbance seemingly had its inception over the southwestern Caribbean Sea on the 12th, although the indications were that it was of but minor intensity. Nevertheless, it caused torrential rains in the vicinity of the Swan Islands during the 12th and 13th. On the 13th there were indications of an imperfectly organized disturbance in the Gulf of Honduras, and moving westward it appeared, as stated before, off Tampico on the morning of the 15th. During its movement westward through British Honduras and Yucatan, press reports tell of torrential rains and unprecedented floods in Salvador, and it is probable that similar conditions prevailed in the adjoining republics, but confirmation of this statement is lacking. Moving northwest from the vicinity of Tampico, the cyclone passed inland during the morning of the 16th immediately south of the Rio Grande and passed up the valley of that river, attended by excessive rains which resulted in unprecedented floods in the lower Rio Grande valley. Northeast storm warnings were dis-

played at 2 p. m. of the 15th at Brownsville, Tex., and at 10 p. m. at Corpus Christi, Tex., and at the same time advices were issued of heavy rains along the lower Texas coast in the ensuing 24 hours. A report of the floods in the lower Rio Grande Valley will be found elsewhere in this number of the MONTHLY WEATHER REVIEW.

## WASHINGTON FORECAST DISTRICT.

In the Washington Forecast District the month was not unusual as to storminess, but rains were frequent and in the North Atlantic States excessive. Few warnings were required; no general displays were ordered for the coastal waters. The disturbances that occurred were of local nature, as, for example, the severe squalls on the Middle Atlantic and New England coasts on the late afternoon of June 11. On the morning of this day small-craft warnings were ordered for the Atlantic coast over and north of Chesapeake Bay, the advices being to the effect that a disturbance of considerable intensity was central north of Lake Ontario and moving eastward and that it would be attended by fresh south and southwest winds and squalls during the afternoon and night of the 11th. The severest of these squalls seems to have occurred in the vicinity of New York City where it did much damage and caused the loss of a considerable number of lives of persons in pleasure boats in the adjacent waters. The

following is an editorial from the *New York Times* on the occurrence of this local windstorm:

In spite of the great amount of damage done by Sunday afternoon's storm, and the many fatalities of which it directly or indirectly was the cause, there is reason for doubting that it was a real tornado—that its brief violence was anything more than an exaggeration of the heavy gust of wind that almost always marks the beginning of an ordinary thundershower. \* \* \* One mystery of the storm was that its approach was unheeded and apparently unseen by the Sunday pleasure seekers whom its arrival was to overwhelm with disaster. Yet they all had been warned, first, by the definite prediction of the Weather Bureau in the morning papers, and, second, by the ominously black clouds that had been gathering in the west for hours.

Small-craft warnings remained displayed through the 12th on the Atlantic coast at and north of Atlantic City, N. J., in connection with the strong westerly winds following the disturbance of the 11th, and on the morning of the 17th small-craft warnings were displayed over the same area, when a disturbance of moderate intensity was over the Great Lakes and moving eastward. Again, on the 21st, small-craft warnings were displayed on the coast at and north of Sandy Hook, N. J., when a disturbance of moderate intensity was central off the New Jersey coast and moving northeastward.

#### CHICAGO FORECAST DISTRICT.

The Forecast District was unusually free from strong winds and frosts during the month of June, 1922. No storm warnings were issued, but small-craft warnings were issued on the morning of June 11 for the Lower Lakes and on the morning of the 16th for Lakes Superior, Michigan, Huron, and Erie.

On the morning of June 25 an advisory message was sent to the observers in the cranberry marshes in Wisconsin to exercise caution in the marshes that night and to be prepared. Of the four special cranberry-marsh stations, two, Mather and Cranmoor, reported light frost the following morning. The bogs were flooded at these places and damage averted. Critical temperatures were not reached in the cranberry marshes at any other time during the month.—*H. J. Cox.*

#### NEW ORLEANS FORECAST DISTRICT.

Moderate weather conditions prevailed along the west Gulf coast during the month of June, 1922, and there was no storm without warnings. A disturbance appeared in the west Gulf on the 16th, and storm warnings were displayed from Corpus Christi to the mouth of the Rio Grande River, which the conditions justified.—*I. M. Cline.*

#### DENVER FORECAST DISTRICT.

Unusually warm and dry weather prevailed in the Denver Forecast District during June, 1922.

No storms of importance crossed the district, and no warnings were issued except for frost in Colorado and northern New Mexico on June 1. Frost temperatures occurred in localities, but no damage was reported.—*Frederick W. Brist.*

#### SAN FRANCISCO FORECAST DISTRICT.

June, 1922, was a quiet month in this district. No storms from the north Pacific moved inland far enough south to cause more than cloudy weather, and a few light showers on the Washington coast. Thunderstorms were frequent in the northern Plateau from the 6th to the 14th, but the accompanying precipitation was light,

and consequently a drought condition prevailed during the month.

Very warm weather prevailed in Nevada on the 24th and 25th, when a record temperature was reported at Tonopah on the 24th, and the highest June temperatures were reported at both Reno and Tonopah on the 25th.

Fire-weather warnings were issued four times during the month, as follows: In Washington, Oregon, and Idaho on the 7th and 23d, and in northern California and Nevada on the 15th and 22d. The warnings issued on the 7th were a failure owing to the occurrence of thunderstorms that afternoon and night causing a drop in temperature. The warnings of the 15th, 22d, and 23d were both timely and highly justified.—*G. H. Willson.*

#### RIVERS AND FLOODS.

By H. C. FRANKENFIELD, Meteorologist.

#### SUMMARY OF THE SPRING FLOODS OF 1922, IN THE MISSISSIPPI DRAINAGE BASIN.

Owing to the wide distribution of frequent and heavy rains there were floods throughout the entire Mississippi Basin except in the Missouri River and tributaries above Kansas City, Mo., and in the Mississippi River north of St. Paul, Minn. In the upper Mississippi Valley the floods, except that of the Illinois River, while not extremely high, were sufficiently so as to cause much apprehension as well as considerable damage. Records were not exceeded in the Mississippi River except at Muscatine, Iowa, where the crest stage on April 24, was 19.5 feet, or 1.5 feet above the previous high-water record of April 8, 1920.

The greatest floods that occurred above Cairo, Ill., were those in the Illinois, White, and Wabash Rivers, especially the Illinois. Over many portions of this river the crest stages were the highest of record, some even exceeding those of the great flood of 1844. The most disastrous overflow occurred at Beardstown, Ill., and vicinity through the breaking of a levee, and about 200,000 acres of cultivated lands were covered. The crest stage on April 20, at this place was 25.1 feet, or 2.6 feet above the previous high-water record of June, 1844.

The lower Mississippi River floods exceeded all previous records below the mouth of the Arkansas River. The river reached the flood stage of 45 feet at Cairo on March 16, and passed below the flood stage of 18 feet at New Orleans, La., on June 4. However, at Baton Rouge, La., the river did not fall below the flood stage of 35 feet until June 12, and below the flood stage of 28 feet at Donaldsonville, La., until June 10, the return of crevasse water holding the waters at high stage.

There were four crevasses of importance. The greatest one, known as the Weecama Crevasse, occurred on April 26, on the right bank of the Mississippi River near Ferriday, La. The next in order of importance occurred on April 27, on the left bank of the Mississippi River at Poydras, La., 14 miles below New Orleans; the third in the right bank of the Atchafalaya system over Bayou des Glaisses, about one-half mile below Hamburg, La., in Avoyelles Parish, and the fourth on April 22, on the right bank of the Mississippi River at Myrtle Grove, La., 25 miles below New Orleans.

The levees surrounding the State farm at Angola, La., also gave way on May 17, and the farm was overflowed.

About 13,200 square miles of land were overflowed during the floods, about 4,400 less than in 1912, almost all of the 1922 deficiency occurring in the Vicksburg,